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Gender influences on subjective evaluations in images

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ABSTRACT

This paper proposes to study gender influences on subjective evaluations in images. Our goal is to verify if some common conclusions in psychology experiences are confirmed during the subjective evaluations we organized.
Our database and our test strategy are the main originalities of this work. We built a new low semantic images database, composed of 350 natural images. The tests were accessible via the Internet and each participant rated 24 randomly selected images. 1741 participants, including 848 men (48.71%) and 893 women (51.29%) assessed our 350 images according to the nature and the power of the emotion. We also ask them to quick evaluate each image (under10 seconds) to have really their ”primary” emotions.
During the analysis of the results of the tests, we observed that women tend to associate more often positive or negative emotions to images than men who consider those images as neutral. The additional neutral ones scored by men are generally classified positive or negative by women. In fact, women scored positive with the low power some images men scored neutral. These results confirm potential differences in gender emotion evaluations and also the common conclusion that women express more emotions than men.

1. INTRODUCTION

Gender differences in emotional impact evaluation can be defined as a part of studies focused on sex differences, which are, according to many aspects of daily life, a large research subject. Research on sex and psychology investigates cognitive and behavioural differences between men and women. The common question of these studies is to find why women and men have different behaviours in the same situations and to model these divergences.

The majority of the researches about sex differences can be resumed in two theories:

- Social theories: the differences between men and women are socially constructed and influenced by factors such as stereotypical gender roles.
- Biological theories: sex differences are caused by their biological differences.

However some authors, for example Halpern (Halpern 2011) argues that psychological sex differences can be based on a combination of social and biological factors.

In biological theories, Hofer et al. (Hofer, et al. 2006) focused on the cerebral activity during emotions perception. For them, emotional differences between genders also reflect genotypic differences in sexual dimorphism of the nervous system. Their studies were also based on the fact that many functional imaging works show differences between genders about emotional memory encoding.

In social theories they are a lot of gender-specific patterns. Fischer et al. (Fischer, et al. 2004) tested some hypothesis. The first one they verified, is "Women report less intense powerful emotions (anger and contempt) and more intense powerless emotions (fear, sadness, shame, and guilt) than men" and this did not vary across countries.

Sex differences are also analysed during evaluations of a database. For example, men and women did not react identically to pleasant, neutral, and unpleasant pictures, in Bradley et al.'s experiences (Bradley, et al. 2001). Women were more reactive to unpleasant materials, rating these pictures as more arousing and more unpleasant. Compared with men, they also rated neutral pictures as slightly less pleasant.

In the rest of this paper, we present our database and describe the experimentations in Section 2. The Section 3 is focused on the results and their analysis and we conclude this work and also present some future works in Section 4.

2. IMAGES DATABASE AND EXPERIMENTATIONS

2.1 Image database

For this study, the database used in (Gbèhounou, Lecellier et Fernandez-Maloigne 2012) has been expanded for new evaluations. This set of images is free to use and composed of 350 low semantic, natural and diversified images. In this paper, "low-semantic" means, that the images do not shock and do not force a strong emotional response. We also chose low semantic images to minimize the potential interactions between emotions on following images during subjective evaluations. This aspect is important to ensure that the emotions indicated for an image is really related to its content and not to the emotional impact of the previous one.

2.2 Experimentations

The tests were accessible via the Internet and offers to the participants to assess nature and power of emotions in 24 images. For the nature, they can choose "Negative", "Neutral" or "Positive". The power varies from "Weak" to "Strong". We chose these information to define emotions because according to us, it is the best way to evaluate globally a "primary" emotion on low semantic database.

Our database was assessed by people of all ages. The large part of them were aged 15 to 30 years and they represent 81.1% of the panel. 1741 participants, including 848 men (48.71%) and 893 women (51.29%), around the world, scored the database. Each observer evaluated 24 randomly selected images if he makes the full test. The average time of observation is 6.6 seconds. It seems really short but it allows us to limit semantic interpretation of an image after a long duration. Each image was assessed by an average of 104.81 observers.

3. RESULTS AND ANALYSIS

Table 1 shows the classification of our database by sex. The nature "Uncategorised" used is for images which cannot be classified because they have two classes (same classification percentage in two natures of emotion) based of the participant scoring.

Table 1: Number of images in each categories of emotion according to gender.

Nature of emotion	Women	Men
Negative	20%	14.57%
Neutral	34.43%	43.43%
Positive	43.43%	39.71%
Uncategorised	1.14%	2.29%

The first conclusion regarding Table 1 is that globally, women found our database positive and the men neutral. So, we can say that women seem more emotive (more positive and negative emotional impacts) than men during evaluation of the same images. These results seem coherent regarding the common conclusion in sex differences in emotions, for example in (Fischer, et al. 2004).

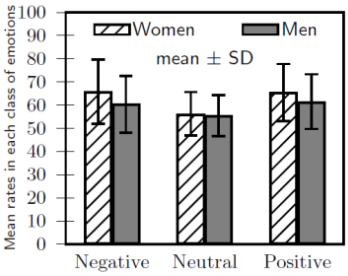
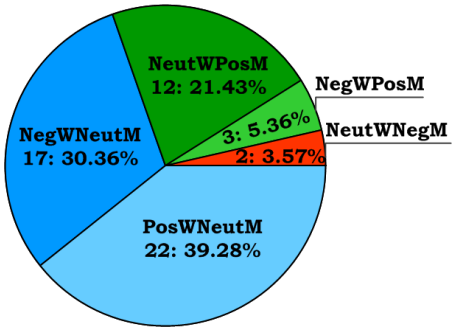


Figure 1: Mean rates in each class of emotions according to gender for the same nature of emotions.

Figure 1 represents, for each sex, the average percentage of people who give the same nature of emotion of an image. This graphic confirms our previous conclusion about the highly emotionality of women.

Except for neutral images, women are more unanimous than men. They are more to feel the same emotion on an image compare to men. For neutral emotions the two sexes have approximately the same percentage. However, for each sex the mean rate of observers who gives the emotional impact of an image is high. This means that, despite the fact that it is a low semantic database, the opinions are consistent.



(a)

Disagreements	Pach of average colours
NegWPosM	
NeutWNegM	
NeutWPosM	
NegWNeutM	
PosWNeutM	

(b)

Figure 2: Disagreements between women and men during the evaluation of emotional impact

On Figure 2, we represent the distribution of the disagreements between genders (a) and the average colours of the images in each kind of disagreements (b). PosWNeutM is for images judged Positive by women and Neutral by men, NegWNeutM is Negative for women and Neutral for Men. Based on the same principle as previously, NegWPosM is Negative for women and Positive for men, NegWPosM is Negative for women and Positive for Men and NeutWNegM is Neutral for women and Negative for Men. It clearly confirms that the majority of the additional neutral images for men is either positive or negative for women.

The large part of differences in judgement is made by images judged Positive by women and Neutral by men. This case can be explained with the difference of sensibility. For example, in the experiences organized by Bradley et al. (Bradley, et al. 2001) women also rated neutral pictures as slightly less pleasant. Even if their database is more semantic

than ours, our results are consistent especially because the power associated with the emotions of concerned images is weak.
Images concerned by the cases NegWPosM and NegWNeutM show the sensibility of men to cold and dark colours.

The results NegWNeutM are particular. In fact, women have more semantically interpreted the images concerned with the previous observations about dark and cold colours. But these images are specific, since they are composed of metal grids, reptiles, bad weather. Semantic added to these specific images plus the presence of dark and cold colours could be the reasons of this difference of emotional impact perception.

4. CONCLUSIONS AND FUTURE WORK

Social aspects (Fischer, et al. 2004) or biological ones (Hofer, et al. 2006) or a combination of the twice (Halpern 2011) can contribute to the differences observed about gender evaluations of emotional impact of images. Emotions are complex reactions and their evaluations seem difficult if the strategy is not adapted. Our strategy was to ask participants to score the nature and the power of the emotions they filled with very general terms. According to us it is the best way to evaluate on a low semantic database.

In our experimentations we did not take care about social or cultural differences between our participants but we compare the results just according to their gender. We did not also measure some biological parameters during experiences. Our objectives were to analyse the behaviours of genders for our tests. We noticed some differences specially for negative and positive emotional impact. For neutral evaluations we cannot compare correctly the ratings because the definition of neutral emotion depends on each one. It can be because an image is neither really positive nor negative or because is does not inspire something. Women seem to be more sensitive to light colours and men judge less negative images with dark colours than women.

The first perspectives of this work are to assess and improve our system (Gbèhounou, Lecellier et Fernandez-Maloigne 2012) to extract emotional impact in image with indexation features on the all database. These ratings will be used to refine indexation results on images database by specifying the request according to gender. The image database and the results will soon be posted with the necessary permits.

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